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Obesity: A Risk Factor of Preeclampsia

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Abstract:

Background: Obesity is a major epidemic of developed world that is now extending to developing countries and is the risk factor of pre-eclampsia which is the major contributor to maternal and foetal morbidity & mortality.

Objective: To determine the frequency of preeclampsia in obese primigravida women visiting the Obstetrics and Gynaecology Outpatient Department of Bahawal Victoria Hospital, Bahawalpur, Pakistan.

Methodology: This cross-sectional descriptive study was conducted in Obstetrics and Gynaecology Outpatient Department of Bahawal Victoria Hospital, Bahawalpur, Pakistan from January 2018 to December 2018. All the Primigravida women with singleton pregnancy of gestational age ≥ 26 weeks assessed by ultrasound between 20-35 years of age were included in the study by non-probability consecutive method. After obtaining ethical approval from hospital ethical committee and informed written consent from all the study subjects, relevant data were documented in a predefined data sheet and body mass index (BMI) was calculated by using the formula: Weight (kg) / Height^2 (m). Women having blood pressure (BP) of 140/90 mmHg or above in third trimester of gestation measured on at least two occasions, 6 hours or more apart accompanied by proteinuria of 300 mg per 24 hours or above in previously normotensive were labelled as preeclampsia and first-time pregnant women having BMI ≥ 30 were taken as obese. Statistical analysis was performed by using computer-based software, Statistical Package for Social Science (SPSS) for windows version 17.0. Mean and standard deviation was calculated for numerical data like age. Frequencies and percentages were calculated for categorical variables. Chi-square test was performed to find the statistical difference regarding preeclampsia distribution between groups and 'p' value <0.05 was considered as a lowest level of significance.

Results: Mean age of the respondents in the study was 27.08±3.59 years. Majority of the women were between the ages of 26-30 years (53.30%). The mean gestational age of the respondents was 34.50±4.33 weeks and most of the women had gestational age ≥ 36 weeks (46.70%). Frequency of obesity in pregnancy was 15.4% and frequency of preeclampsia in obese primigravida was 55.3%.

Conclusion: It is concluded that frequency of preeclampsia is higher in obese primigravida compared to non-obese primigravida.

Key words: Obesity, Preeclampsia, Primigravida

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Abbreviations:

Introduction:

Preeclampsia a hypertensive disorder affecting 2-8% pregnancies worldwide, can be associated with high maternal morbidity and mortality and is characterized by high blood pressure and significant amount of urine in the protein. It involves many body systems including the presence of low blood platelet count (Thrombocytopenia), impaired liver functions, renal dysfunctions, fluid accumulations in the lungs (Pulmonary oedema), visual disturbances and if left untreated can develop eclampsia, a life-threatening condition during pregnancy (1, 2).

Obesity, the most common nutritional disorder and a major public health problem affecting almost 22% of the adult population, increases the likelihood of many diseases particularly cardiovascular diseases, type-II diabetes mellitus, obstructive sleep apnoea, certain types of cancer osteoarthritis and pregnancy complications. The obesity related pregnancy complications can be broadly classified into those affecting the mother and those affecting the foetus and neonate. Maternal complications include increased risk of adverse pregnancy outcomes like gestational diabetes mellitus, pregnancy induced hypertensive disorders (Preeclampsia and eclampsia), infections and postpartum haemorrhage while foetus may be large for dates and increased risk of still births (3, 4, 5).

It is not known clearly why obesity is a risk factor of preeclampsia but increased of preeclampsia in obese women has been reported in many previous studies. Lakhanpal et al. revealed the higher incidence of preeclampsia in obese pregnant women compared to non-obese (6). Similarly, Chaudhary et al. also found that incidence of preeclampsia in 35% of women compared to 20% in non-obese women (7).

This study was designed to determine the frequency of preeclampsia in obese primigravida women visiting the Obstetrics and Gynaecology Outpatient Department of Bahawal Victoria Hospital, Bahawalpur, Pakistan.

Materials and Methods:

Study Design: It was a descriptive cross-sectional study.

Study Duration and Setting: From January 2018 to December 2018, in Outpatient Department of Obstetrics and Gynaecology of Bahawal Victoria Hospital, Bahawalpur, Pakistan.

Sample Size: Expecting the prevalence of preeclampsia 2% in a population (1), 1% precision and 95% level of confidence calculated sample size was 726.

Sampling Technique: Non-probability consecutive method.

Inclusion Criteria: Primigravida women with singleton pregnancy of gestational age ≥ 26 weeks assessed by ultrasound between 20-35years age were included in the study.

Exclusion Criteria: The women with history of chronic hypertension, diabetes mellitus, drugs intake, smoking, alcoholism, liver, cardiac or renal diseases or any other major illness were excluded from the study.

Tools of Data Collection: After obtaining ethical approval from hospital ethical committee and informed written consent from all the study subjects relevant data were documented in a predefined data sheet and body mass index (BMI) was calculated by using the formula;

Weight (kg) / Height^2 (m)

Operational Definitions:

Preeclampsia: Preeclampsia was defined as blood pressure (BP) of 140/90 mmHg or

above in third trimester of gestation measured on at least two occasions 6 hours or more apart accompanied by proteinuria of 300 mg per 24 hours or above in previously normotensive women.

Obese Primigravida: First time pregnant women having BMI ≥ 30 was taken as obese.

Data Analysis: Statistical analysis was performed by using computer-based software, Statistical Package for Social Science (SPSS) for windows version 17. Mean and standard deviation was calculated for numerical data like age. Frequencies and percentages were calculated for categorical variables. Chi-square test was performed to find the statistical difference regarding preeclampsia distribution between groups and 'p' value <0.05 was considered as a lowest level of significance.

Results:

Mean age of the respondents in the study was 27.08±3.59 years. Age distribution of respondents (n=726) showed that most of them were between the ages of 26-30 years (53.30%) followed by 20-25 years (26.73%) and 31-35 years (19.97%) as shown in table I. The mean gestational age of the respondents was 34.50±4.33 weeks. Majority of the women had gestational age ≥ 36 weeks (46.70%) and 23.14% were between 26-30 weeks of gestation (Table II).

In this study, frequency of obesity in pregnancy was 15.4% and 84.6% women were non-obese (Table III).

Frequency of preeclampsia in obese primigravida was 63.4% while in non-obese primigravida group, it was 13.4% (Table IV).

Table I: Age distribution of the respondents (n=726)

Age (years)	Frequency	Percentage
20-25	194	26.73%
26-30	387	53.30%
31-35	145	19.97%
Total	726	100%

Table II: Distribution of the respondents according to gestational age (n=726)

Gestational Age (weeks)	Frequency	Percentage
26-30	168	23.14%
31-35	219	30.16%
≥36	339	46.70%
Total	726	100%

Table III: Frequency of obesity among respondents (n=726)

Obesity	Frequency	Percentage
Yes	112	15.4%
No	614	84.6%
Total	726	100%

Table IV: Frequency of preeclampsia in obese and non-obese women (n=726)

Preeclampsia	Obese		Non-obese		Total
Yes	62	55.3%	82	13.4%	153
No	50	44.7%	532	86.6%	573
Total	112	100%	614	100%	726

$\chi 2 = 105.04$, df =1, p=0.0000

Discussion:

Obesity is a major epidemic of developed world that is now extending to developing countries. Mean age of the respondents in our study was 27.08±3.59 years with majority of women in the age group of 26 - 30 years. Almost similar findings were observed in the studies of Fatima et al (5). and Lakhanpal et al (6). Our study revealed that

the mean gestational age of the respondents was 34.50±4.33 weeks. These results are comparable with many other studies (7, 8).

The study showed that frequency of obesity in primigravida women was 15.4%. Frequency of preeclampsia in obese primigravida women was found 55.3% while in non-obese primigravida women it was 13.4%. The difference between two groups was found statistically significant at p-value 0.0000. Study conducted by Lakhanpal et al. revealed that preeclampsia complicated: 38% pregnancies in women with BMI ≥30 as compared to 8% in women with BMI ≤30 (6). Chaudhary et al. also found that 35% of obese women had preeclampsia compared to 20% in non-obese (7). Increased incidence of preeclampsia had been reported by Roman et al (9). Obesity has been implicated as a risk factor for both maternal and foetal complications. Its association with gestational diabetes and preeclampsia is established in many other studies (10, 11). The frequency of pre-eclampsia in obese women is found higher in our study as compared to studies conducted by Lakhanpal et al. and Roman et al. which may be due the reason that our study was hospital based.

Conclusion:

As a whole, it can be concluded that frequency of preeclampsia in obese primigravida is higher compared to non-obese primigravida which may show that obesity is a risk factor for preeclampsia. As it was a cross sectional descriptive study it imposes certain limitations and is potentially subject to diverse biases and variations. Further analysis with analytical studies would be necessary to clarify the obesity as definite risk factor for development of preeclampsia in pregnancy.

Conflict of Interest: Authors do not have any conflict of interest.

Human and Animal Rights: No rights violated during the study.

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